

## REMARKS

In the Office Action, the Examiner noted that Claims 1-20 are pending in the application, and Claims 1-20 have been rejected.

## CLAIM REJECTIONS

Claim 1 stands rejected under 35 USC §102(e) as being clearly anticipated by the Katz ('490). The Applicants respectfully submit that the Examiner has not made a *prima facie* case of anticipation with respect to Claim 1. With respect to Claim 1, Katz does not teach or disclose a sensor having a signal and being positioned to detect flow separation or side forces, wherein the signal of the sensor is used in part to activate or deactivate the at least one flow effector. Furthermore, Katz does not teach of a missile or aircraft forebody, but rather of a body moving through a fluid medium. Instead, Katz teaches the use of a noise suppression device for reducing noise related drag. More specifically, Katz teaches the use of a pressure sensor to detect acoustic signals near a body moving through a fluid medium. The sensors detect "both turbulence-induced acoustic signals generated in the (fluid) medium by the body as it moves through the medium, as well as signals from external acoustic signal sources" (Column 10, lines 40-44), not flow separation or side forces on a missile or aircraft forebody as claimed. The signal from the sensor in Katz is coupled with a noise suppression filter to separate out the turbulence induced acoustic signal so that an acoustic signal generator can drive an acoustic transducer to "inject an opposite-phase acoustic signal" to "reduce or eliminate the turbulence-induced acoustic signals" by the body as it moves through the fluid medium (Column 10, line 54 to Column 11, line 21). Given the reasons set forth in this response, the Applicants respectfully request withdrawal of this rejection.

Claims 2-6 stand rejected under 35 USC §103 as being unpatentable over Katz ('490) in view of Lisy et al. ('904). The Applicants respectfully submit that the Examiner has not made a *prima facie* case of obviousness with respect to Claims 2-6.

In addition to the above with respect to Claim 2, neither Katz nor Lisy ('904) teach or disclose activating or deactivating at least one flow effector to minimize flow separation or change side forces on a missile or aircraft forebody. Furthermore, Lisy does not teach or disclose as the Examiner alleges of multiple flow effectors arranged

around the nose cone presumably of a missile, of flow effectors on a missile or aircraft forebody, of at least one sensor being positioned to detect flow separation or side forces on a missile or aircraft forebody, of a closed loop control system or of activating and deactivating the at least one flow effector based on at least in part the signal of the at least one sensor. In addition to the above with respect to Claim 3, neither Katz nor Lisy teach or disclose a closed loop control system that activates and deactivates the at least one flow effector to create commanded side forces on a missile or aircraft forebody. In addition to the above with respect to Claims 4 and 5, neither Katz nor Lisy teach or disclose a closed loop control system that activates the at least one flow effector by oscillation. In addition to the above with respect to Claims 6 and 7, neither Katz nor Lisy teach or disclose a closed loop control system wherein the flow effector is only activated at angles of attack of the missile or aircraft forebody of between 20 to about 60 degrees.

The Applicants further submit that the Examiner has not given any reason, suggestion, or motivation in the references, or from the references cited as a whole for the person of ordinary skill to have combined or modified the references. The Applicants submit that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting such combination. If such suggestion or incentive is in the references, the Applicants respectfully request that the Examiner particularly point out the relevant sections of those references cited which suggest or motivate the combination of those references, particularly given the large differences in the types of devices described by these two references and their applications (i.e., one being applied on the skin and the other being implanted within the subject's body). If the Examiner is alleging that a person of ordinary skill would have been motivated to combine such references, the Applicant respectfully submits that how a person of ordinary skill in the art would have been motivated must be in the personal knowledge of the Examiner, and therefore respectfully requests that the Examiner in the next Official Action submit an affidavit detailing as specifically as possible such motivation (see 37 CFR §1.104 (d) (2)). Given the reasons in this response, the Applicants respectfully request withdrawal of this rejection.

Claims 8, 13-16, 18 and 20 stand rejected under 35 USC §102(b) as being anticipated by Zell ('050). The Applicants respectfully submit that the Examiner has not made a *prima facie* case of anticipation with respect to Claim 8, 11-16, and 18-20.

With respect to Claim 8, Zell does not teach or disclose a flow control system with at least one sensor having a signal, the at least one sensor being positioned to detect flow separation or side forces on the missile or aircraft forebody; a closed loop control system; an inertial measurement unit having an output; or wherein the closed loop control system is used for activating and deactivating the at least one flow effector based in part on the signal of the at least one sensor and the output of the inertial measurement unit. Zell instead teaches of a surface distention system, which is connected to a flight control 58 "located inside the cockpit and operated by the pilot" which sends the signal to a valve actuator (Column 5, lines 22-37) not to a closed loop control system as claimed. In addition to the comments about Claim 8, with respect to Claim 13 Zell further does not teach or disclose closed loop control system which activates and deactivates the at least one flow effector to create commanded side forces on the missile or aircraft forebody. In addition to the comments about Claims 8, with respect to Claims 12 and 14 Zell further does not teach or disclose a flow control system where the flow effectors are capable of being activated and deactivated at frequencies of at least 20 Hz, or a closed loop control system which activates and deactivates the at least one flow effector to create additional side forces on the missile or aircraft forebody.

With respect to Claim 15, Zell does not teach or disclose a method of maneuvering a missile or aircraft forebody including the steps of 1) estimating or determining side forces on a missile or aircraft forebody using a sensor being positioned to estimate or determine side forces on the missile or aircraft forebody, the missile or aircraft forebody further comprising ....a closed loop control system for controlling the at least one flow effector 2) activating at least one flow effector to change the side forces based in part on the signal from the at least one sensor, 3) re-estimating or determining the side forces, or 4) deactivating the flow effector in response to the changed side forces. In addition to the comments about Claim 15, with respect to Claim 16 Zell does not teach or disclose oscillation of at least one flow effector. Given the reasons set forth in this response, the Applicants respectfully request withdrawal of this rejection.

Claims 9-10, 17 and 19 stand rejected under 35 USC §103 as being unpatentable over Zell ('050) in view of Lisy et al. ('904). The Applicants respectfully submit that the Examiner has not made a *prima facie* case of anticipation with respect to Claims 9-10, 17 and 19.

In addition to the above comments with respect to Zell with respect to independent Claims 8, Lisy does not teach nor disclose at least one sensor having a sensor, the at least one sensor being positioned to detect flow separation or side forces on the missile or aircraft forebody; an inertial measurement unit having an output; a closed loop control system; or wherein the closed loop control system is used for activating and deactivating the at least one flow effector based on at least in part the signal of the at least one sensor and the output of the inertial measurement unit. In addition with respect to Claim 10, neither Lisy nor Zell disclose or teach of a flow control system comprising at least six flow effectors wherein the at least six flow effectors are positioned and separated substantially equi-distantly about a center of the forebody of the missile or aircraft. In addition to the above comments with respect to Zell with respect to independent Claims 15, Lisy does not teach nor disclose a method of maneuvering a missile or aircraft forebody including the steps of 1) estimating or determining side forces on a missile or aircraft forebody using a sensor being positioned to estimate or determine side forces on the missile or aircraft forebody, the missile or aircraft forebody further comprising ....a closed loop control system for controlling the at least one flow effector 2) activating at least one flow effector to change the side forces based in part on the signal from the at least one sensor, 3) re-estimating or determining the side forces, or 4) deactivating the flow effector in response to the changed side forces. In addition with respect to Claim 17, neither Lisy nor Zell disclose or teach of a flow control system comprising at least six flow effectors wherein the at least six flow effectors are positioned and separated substantially equi-distantly about a center of the forebody of the missile or aircraft. In addition with respect to claim 19 neither Lisy nor Zell teach or disclose a closed loop control system wherein the flow effector is only activated at angles of attack of the missile or aircraft forebody of between 20 to about 60 degrees.

The Applicants further submit that the Examiner has not given any reason, suggestion, or motivation in the references, or from the references cited as a whole for the

person of ordinary skill to have combined or modified the references. The Applicants submit that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting such combination. If such suggestion or incentive is in the references, the Applicants respectfully request that the Examiner particularly point out the relevant sections of those references cited which suggest or motivate the combination of those references, particularly given the large differences in the types of devices described by these two references and their applications (i.e., one being applied on the skin and the other being implanted within the subject's body). If the Examiner is alleging that a person of ordinary skill would have been motivated to combine such references, the Applicant respectfully submits that how a person of ordinary skill in the art would have been motivated must be in the personal knowledge of the Examiner, and therefore respectfully requests that the Examiner in the next Official Action submit an affidavit detailing as specifically as possible such motivation (see 37 CFR §1.104 (d) (2)). Given the reasons in this response, the Applicants respectfully request withdrawal of this rejection.

Claims 11 and 12 stand rejected under 35 USC §103 as being unpatentable over Zell ('050) in view of Katz ('490). The Applicants respectfully submit that the Examiner has not made a *prima facie* case of anticipation with respect to Claims 11 and 12.

In addition to the above comments with respect to Zell with respect to independent Claims 8, Katz does not teach nor disclose at least one sensor having a sensor, the at least one sensor being positioned to detect flow separation or side forces on the missile or aircraft forebody; an inertial measurement unit having an output; a closed loop control system; or wherein the closed loop control system is used for activating and deactivating the at least one flow effector based on at least in part the signal of the at least one sensor and the output of the inertial measurement unit. In addition with respect to Claims 11 and 12, neither Katz nor Zell disclose or teach of a flow control system wherein the flow effectors are capable of being activated and deactivated at frequencies of at least 1 Hz and 20 Hz respectively.

The Applicants further submit that the Examiner has not given any reason, suggestion, or motivation in the references, or from the references cited as a whole for the

person of ordinary skill to have combined or modified the references. The Applicants submit that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting such combination. If such suggestion or incentive is in the references, the Applicants respectfully request that the Examiner particularly point out the relevant sections of those references cited which suggest or motivate the combination of those references, particularly given the large differences in the types of devices described by these two references and their applications (i.e., one being applied on the skin and the other being implanted within the subject's body). If the Examiner is alleging that a person of ordinary skill would have been motivated to combine such references, the Applicant respectfully submits that how a person of ordinary skill in the art would have been motivated must be in the personal knowledge of the Examiner, and therefore respectfully requests that the Examiner in the next Official Action submit an affidavit detailing as specifically as possible such motivation (see 37 CFR §1.104 (d) (2)). Given the reasons in this response, the Applicants respectfully request withdrawal of this rejection.

### CONCLUSION

For all the above reasons the Applicants respectfully submit that the application is in condition for allowance and that action is earnestly solicited.

Respectfully submitted,

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Dated



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